Environmental Resources Management

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14 August 2015

Mr. Dave Lacey
ODEQ
DEQ Northwest Region Office
700 NE Multnomah Street
Suite #600
Portland, OR 97232

RE: ***Response to DEQ Review "Appendix D-Storm Water Source Control and Treatment Measure Design Update" Vigor Industrial – Swan Island Upland Facility ESCI #271***

Dear Mr. Lacey:

On behalf of Vigor Industrial LLC (Vigor), ERM-West, Inc. (ERM) has prepared this letter in response to Oregon Department of Environmental Quality (ODEQ) comments on the *Appendix D-Storm Water Source Control and Treatment Measure Design Update* (ERM 2015). Agency comments were provided in a letter dated 17 July 2015.

Each of the ODEQ comments is provided below in italic font, followed by a response from Vigor.

General Comments

1. *As with all of the previous design reports, this report does not present enough information to complete a review. DEQ has repeatedly requested Vigor provide an adequate design report. Our most recent review letter dated February 3, 2015 requested that Vigor provide this information within 60 days. The Design Update does not provide this information. DEQ again requests this information. Please review our February 2, 2015 and February 3, 2015 letters and provide a response within 30 days.*

   Vigor notes that the purpose of the *Appendix D-Storm Water Source Control and Treatment Measure Design Update* was to meet the requirements of the NPDES 1200Z individual permit requirements for treatment of zinc. Treatment of additional parameters was included in the *Appendix D-Storm Water Source Control and Treatment*

Measure Design Update in order to maintain consistency with previous Storm Water Pollution Control and Prevention Plan submittals.

The *Storm Water Source Control Measure Design Update* report (ERM 2015b) was submitted to the ODEQ on 14 August 2015, which provides the requested information related to Portland Harbor Source Control requirements.

2. *The interim actions do not address all of the source control contaminants of potential concern within the target basins*

As noted above, the purpose of the *Appendix D-Storm Water Source Control and Treatment Measure Design Update* was to meet the requirements of the NPDES 1200Z individual permit requirements for treatment of zinc. Treatment of additional parameters was included in the *Appendix D-Storm Water Source Control and Treatment Measure Design Update* in order to maintain consistency with previous Storm Water Pollution Control and Prevention Plan submittals.

The *Storm Water Source Control Measure Design Update* report (ERM 2015b) was submitted to the ODEQ on 14 August 2015, which provides the requested information related to Portland Harbor Source Control requirements.

3. *As noted in our February 2, 2015 letter, insufficient data is available for exclusion of runoff from basin P from treatment. Per our subsequent discussions and recap of our February 6, 2015 meeting, either additional data must be collected and evaluated or sizing of proposed measures should include capacity for treatment of runoff from basin P.*

Comment noted. As presented in the *Storm Water Source Control Measure Design Update* report (ERM 2015b), additional data from Outfall P will be collected and evaluated.

4. *Vigor's delay in completing design and implementation of the South Side Source Control Measures is not consistent with Vigor's previous commitment to have effective source control measures in place by the 1200Z permit deadline of May 30, 2015. DEQ notes that Vigor failed to implement engineered controls by the permit required deadline and*

we are evaluating our decision to link the implementation of source control with the NPDES permit requirements.

The ODEQ's statement regarding Vigor's commitment to have source control measures in place by the 1200Z permit deadline is not accurate. The ODEQ was fully aware that the planned Bioretention Pond would not be constructed by the permit deadline, and that Vigor's sole objective at this point was to install interim measures to address zinc in storm water discharge from Outfalls M and O. This has been accomplished. There is nothing in the NPDES 1200Z permit prohibiting Vigor from completely changing its Tier II strategy, or implementing interim measures until the final treatment measure is in place. Due to the size and complexity of the site, the number and variety of constituents being addressed, and the hard schedules imposed by the permit, it is unavoidable that reaching the overall objective of implementing a comprehensive storm water treatment program will continue to necessitate the deployment of interim measures.

Vigor notes that since 2007, in addition to implementation of numerous additional BMPs previously documented, several permanent and interim source control measures have been implemented over large portions of the facility. These measures have resulted in significant reductions in contaminant mass loading to the Willamette River, and include:

1) The Barge Buildway (3 acres) was re-conveyed from the storm water system to the Ballast Water Treatment Plant system in 2007. This storm water is now captured, treated, and discharge to sanitary sewer under a City of Portland POTW permit. This source control measure removed a significant potential source of storm water contaminants from current site activities.
2) Installation of a pilot electrocoagulation system at Outfall Q in May 2013, representing treatment of 8.22 acres of the portion of the site with the highest contaminant concentrations. NPDES permit benchmarks have been consistently achieved at Outfall Q since February 2014. This represents implementation of treatment measures for approximately 38% of the area subject to Tier II treatment measures requirements over <u>18 months in advance</u> of the NPDES permit deadline.

3) Consistent with the NPDES 1200Z permit and the Portland Harbor Joint Source Control Strategy guidance, Vigor has implemented measures to eliminate sources of pollution rather than treat stormwater to remove constituents. For example, in 2008 Vigor switched its abrasive blasting process from dry blasting to wet blasting specifically to reduce particulate matter emissions, which were a significant source of copper and zinc impacting stormwater. This was a substantial effort that took nearly a year to implement, requiring testing, retooling, worker training, and coordination with Vigor's customers and coating suppliers to secure the necessary approvals. This effort reduced Vigor's particulate emissions by over **100 tons annually**, and consequently, significantly reduced the total mass of copper and zinc exposed to stormwater.
4) In 2012, Vigor began testing the efficacy of Grattix boxes to remove heavy metals in stormwater from roof runoff. Vigor now has over 25 Grattix boxes deployed throughout the shipyard, that have been proven to be successful at removing copper and zinc from stormwater runoff.

Vigor also notes that the shipyard is a large and complex facility with a stormwater conveyance system built in 1942, and last expanded in 1979, both well before there was any societal concern about the environmental impacts of stormwater. There are several miles of underground pipes up to 20 feet below ground surface, that are overlaid and crisscrossed by miles of underground utilities, and that discharges through more than 50 outfalls. Over one quarter of the surface area of the facility consists of piers, wharfs and relieving platforms, built over water, with very limited access to build or modify stormwater infrastructure. Developing the conceptual retrofit engineering to collect, intercept, and convey stormwater within this system presents a significant technical challenge that is integral to developing source control treatment options. The re-conveyance design for Phase 3 has taken nearly a year to accomplish. Vigor is continuing to evaluate isolated and particularly challenging areas of the facility to identify collection and conveyance solutions that are implementable.

Based on the most recent NPES 1200Z discharge monitoring report submitted in July 2015, the remaining monitored outfalls (E, B, G, L,

and LD1-B) have geometric mean concentrations of copper and/or zinc that exceeded NPDES 1200Z permit benchmarks. These outfalls represent the remaining area of the site not already addressed by the Bioretention Pond SCM or previously installed source control measures (i.e. Barge buildway re-conveyance). Based on these benchmark exceedances, Vigor is required to implement treatment measures for storm water runoff from these remaining areas. As described in the *Storm Water Source Control Measure Design Update*, Phases 4 and 5 are intended to address both the NPDES Tier II requirements and Portland Harbor source control requirements. The deadline for implementation of Tier II treatment measures for these remaining areas of the site is 30 June 2017.

During the stormwater source control and evaluation process, which began in 2006, through the 2012/2013 rollout of the NPDES 1200Z permit renewal and associated additional treatment requirements, to the current design and implementation of interim and permanent source control measures, Vigor has endeavored to be responsive to multiple stakeholders including the City of Portland, ODEQ, EPA, and third parties. Throughout this process, Vigor's goal has been to maintain permit compliance while working towards an effective and efficient solution for Portland Harbor source control. This process has been affected by the need to address significant uncertainty regarding source control screening evaluation requirements, changing permit requirements, the definition of sufficient source control for stormwater, City of Portland Bureau of Development Services permitting requirements, as well as delays associated with the challenges of collecting representative storm water samples that meet the data quality objectives of Vigor and ODEQ for the purpose of source control evaluation and treatment system design.

An issue of genuine and justified concern to Vigor is uncertainty surrounding source control performance metrics. ODEQ has persistently deferred specifying quantitative metrics that formally and decisively define the adequacy of storm water source control. For a facility the size of Vigor's Portland facility, the cost implications of source control are significant, a condition that begs for certainty to minimize the potential for incurring additional source control investments in the future.

A design storm size of 1.25 inches for the purpose of meeting NPDES Tier II mass reduction requirements was only finalized in November 2014, approximately eight months after this design storm size was proposed by Vigor. This is a fundamental parameter for evaluating Tier II mass reduction and designing a source control strategy. As such, the design storm should have been an established parameter consistently applied across harbor sites, and agreed upon by all agencies. Vigor notes that in comments on subsequent design deliverables, the EPA has indicated that a design storm size of 1.25-inches may not be sufficient for the purpose of achieving source control.

Vigor understands that revisions to the regional industrial source control performance curves (Appendix E of the Guidance for Evaluating the Stormwater Pathway at Cleanup Sites, ODEQ October 2010) are underway. There is uncertainty with how these curves will be used in the performance evaluation of the proposed SCMs, or how these relate to the draft Portland Harbor Preliminary Remediation Goals, recently published by the EPA. It is not clear to Vigor what the consequences of sporadic detections above the "knee of the curve" for individual contaminants. Similarly, it is not clear what the consequences will be for consistent "attainment" for a majority of contaminants and inconsistent, yet modest, non-attainment for one contaminant.

Despite this uncertainty, Vigor has continued to progress through the design and permitting of a cost-effective implementation of the proposed source control measure, while responding to changing business needs and operations of the active facility. As noted above, Vigor has proactively implemented effective interim measures in advance of permit deadlines, which have significantly reduced the mass loading of potential sources of contaminants in stormwater.

Specific Comments

1. *Page 2. Section 2.0 Storm Water Source Control. Bullet number 1. The Tier II requirements of the NPDES permit deadline were May 30, 2015, not June 30, 2015 as stated in the report. Please review DEQ's February 25, 2014 letter that clarified this deadline.*

Vigor installed the Outfall Q interim treatment measure (electrocoagulation system) in November 2013, approximately 18 months in advance of the permit deadline. The remaining interim treatment measures for outfalls M and O were installed by 14 June 2015. Vigor notes that the text of the NPDES 1200Z permit and cover letter is confusing regarding the Tier II deadlines. The City of Portland cover letter, dated 3 June 2013, states that Vigor is"*…required to meet all monitoring and corrective action requirements depending on the year of coverage (1st, 2nd, 3rd, or 4th). The table below provides the date ranges for meeting those requirements.*" A copy of the table is provided below.

1st Year	2nd Year	3rd Year	4th Year
July 1, 2013 to June 30, 2014	July 1, 2014 to June 30, 2015	July 1, 2015 to June 30, 2016	July 1, 2016 to June 30, 2017

Vigor's understanding of the NPDES permit requirements for Tier II treatment measure implementation for the area represented by Outfall Q, is that the measures were required to be installed in the second year of coverage, which ended on 30 June 2015. Under the ODEQ's rationale, the Tier II deadline was 3 June 2015, not 30 May 2015, since that is the date of the renewal letter issued by the city. The 3 June 2015 date was also stated by Ms. Johnson during her June inspection, suggesting there is even some confusion between the ODEQ and City of Portland concerning the deadline.

Vigor additionally notes that rainfall measured at the Swan Island rain gauge during the period 1 June through 14 June 2015 was 0.18 inches, which fell between 1 June and 3 June 2015. No measurable discharge from the outfalls occurred during this very low intensity event, and as such, there was no discharge of zinc in storm water at all.

2. *Page 2. Section 2.0 Storm Water Source Control. Bullet number 3. As discussed in our February 2, 2015 review of the Storm Water Data Gaps Investigation and Site-Wide Conceptual Design Update Report, and again in our February 3, 2015 review of the Storm Water Source Control Measure Basis of Design Update Report, source control is needed to address arsenic, cadmium, copper, lead, mercury, zinc, PAHs, phthalate esters, PCBs, and TBT in all outfall basins. The*

Design Update omitted mercury and PCBs and limited phthalate esters to bis-2-etheylhexly-phthalate.

Mercury and PCBs have been included as contaminants requiring source control in the *Storm Water Source Control Measure Design Update* report (ERM 2015b). This includes estimated removal rates. Vigor notes that the estimated total mass of mercury in stormwater at the site is 0.0012 pounds (lbs), with an anticipated removal rate of 0.007 lbs per year. The estimated total mass of PCBs in stormwater at the site is 0.002 lbs, with an anticipated removal rate of 0.0014 lbs per year. Based on average densities, this represents a total annual volumetric loading, before treatment, of 0.19 milliliters per year for mercury and 2.8 milliliters per year of PCB oil.

Aluminum was previously included as a contaminant in storm water requiring source control (ODEQ 2015). However, in the updated *Draft Final Feasibility Study Report* (USEPA 2015) for Portland Harbor, aluminum was eliminated as a contaminant of concern as it is considered "not ecologically significant." Based on this conclusion, aluminum has been removed as a contaminant requiring source control at the site. Vigor notes that under the current NPDES permit, aluminum is a sector-specific pollutant that requires monitoring and has a benchmark.

In addition to BEHP, the phthalate esters butyl benzyl phthalate, dibutylphthalate, dimethylphthalate, and di-n-octylphthalate have been detected in catch basin sediment or storm water discharge samples. Only two SLV exceedances for dibutyl phthalate have been observed in the entire storm water source control program. Exceedance quotients for both these samples were less than 10. Vigor notes that the SLV for dibutyl phthalate is based on Table 33c (OAR 340-41) and is a Water Quality Guidance Value, not a criterion. Based on this evaluation, dibutyl phthalate was considered a low priority for source control. Additionally, the updated *Draft Final Feasibility Study Report* (USEPA 2015) for Portland Harbor concluded that dibutyl phthalate was "not ecologically significant", and therefore eliminated as a contaminant of concern. Based on this conclusion, butyl benzyl phthalate, dibutylphthalate, dimethylphthalate, and di-n-octylphthalate were removed as contaminants requiring source control at the Vigor site.

3. *Page 2, Section 2.0 Storm Water Source Control. Bullet number 3. As discussed in our February 2, 2015 review of Storm Water Data Gaps Investigation and Site-Wide Conceptual Design Update Report, and again in our February 3, 2015 review of the Storm Water Source Control Measure Basis of Design Update Report, the objective of source control needs to be expanded to include prevention of unacceptable risk to in-water receptors, in addition to the stated objective of preventing sediment recontamination.*

Vigor notes that it has not been established that stormwater runoff from the facility possess any unacceptable risk to in-water receptors. In order to accommodate the ODEQ's request, the objectives of the source control measures as presented in the *Storm Water Source Control Measure Design Update* report (ERM 2015b) have been revised as follows:

"Prevent potential sediment recontamination and meet water-quality screening criteria presented in the JSCS by reducing the loading of arsenic, cadmium, copper, lead, mercury, zinc, polynuclear aromatic hydrocarbons (PAHs), bis-2-ethylhexyl-phthalate (BEHP), polychlorinated biphenyls (PCBs), and tributyltin (TBT) in storm water discharging to the Willamette River."

4. *Page 2, Section 2.1 Proposed Site-Wide Storm Water Management. The report states that the "specific conveyance re-routing and location of treatment measures are presented in Attachment A." However, Attachment A does not appear to show any re-routing information.*

The sentence has been removed from the *Storm Water Source Control Measure Design Update* report. Conveyance re-routing is shown in Attachment B of the *Storm Water Source Control Measure Design Update* report.

5. *Page 2, Section 2.1 Proposed Site-Wide Storm Water Management. DEQ notes that DEQ did not approve the March 2013 or December 2014 SWPCP updates, as the City of Portland administers this aspect of 1200Z permit implementation. DEQ did review the Storm Water Source Control Measure Design Updated and determined that the*

report did not provide sufficient engineering specification on the bioretention pond for adequate review of the basis of design or the design itself, as documented in our February 3, 2015 letter.

The sentence has been revised to indicate that approval of the revised SWPCP was provided by the City of Portland.

6. *Page 3. Section 2.1 Proposed Site-Wide Storm Water Management. The report states that Phase 3, Phase 4 and Phase 5 are intended to complete source control for the Site in advance of the implementation of the Portland Harbor sediment remedial action. It is unclear from this statement if Vigor still intends to implement the North Side Source Control Measure. Please confirm in writing that Vigor intends to implement the North Side Source Control Measures and provide a schedule to achieve this objective.*

Vigor notes that the nomenclature of the proposed bioretention facility has been changed to the Bioretention Pond (formerly referred to as the "Southside Bioretention Pond." This change was made to more accurately reflect the total proposed catchment area, which actually encompasses large portions of the north and south sides within the eastern half of the facility. The remaining catchment areas within the facility will be addressed by the Electrocoagulation System, as described in the *Storm Water Source Control Measure Design Update* report. As noted above, based on the geometric mean exceedances reported in the June 2015 DMR, treatment measures to address the remaining portions of the site are required to be implemented by 30 June 2017. However, this is a very aggressive schedule to have the final source control measures in place given the re-conveyance challenges noted above. Vigor will likely need to rely upon interim measures in order to meet these NPDES 1200Z permit deadlines. An updated implementation schedule has been provided in the *Storm Water Source Control Measure Design Update.*

7. *Page 4. Section 2.2.2 Additional Interim Roof Drain Treatment Measures. The potential effectiveness of the proposed interim roof drain treatment measures (i.e. absorbent socks, Grattix Boxes, and catch basin biofiltration inserts) cannot be assessed. Engineering specifications are not provided for any of the interim actions and sufficient evidence of effective application at other locations is not*

provided to support the use of absorbent socks or catch basin biofiltration inserts. As discussed during our site visit on May 29, 2015, DEQ is concerned that placing the proposed materials in catch basins will result in localized flooding and potential overland flow of untreated stormwater to discharge points.

Grattix Box pilot study performance data were included in the A*ppendix D-Storm Water Source Control and Treatment Measure Design Update*. The effectiveness for contaminant removal significantly exceeded anticipated performance (e.g. 98 percent zinc removal). The number and placement of Grattix boxes on roof drains was determined through a semi-quantitative evaluation based on Vigor's experience with the pilot study Grattix Box system, the design infiltration rate of 1 inch per minute and estimated roof drainage volumes.

Vigor notes that the majority of drainage in the Outfall O and M catchments is associated with roof drainage from Buildings 4 and 10. Grattix boxes have been installed at the individual roof drains for Building 10, and around the perimeter of Building 4 in front of each bay. In the event that a roof drain Grattix box is overwhelmed, the overflow from the Grattix box will be to the ground immediately adjacent, which drains individual catch basins for each bay. Vigor's experience with the storm water system indicates that the catch basins do not receive significant surface runoff from the ground under normal operating conditions. During high flow events, the roof drain Grattix box bypass flow will flow to the adjacent catch basins and undergo treatment in the individual catch basin biofiltration system prior to discharge to the combined storm water trunk line.

Absorbent socks, manufactured by Cleanway USA to remove zinc from stormwater, have been placed in the storm water trunk lines that receive the Building 4 roof runoff. Building 4 is equipped with a membrane roof, and has limited exposure to sources of zinc.

8. *Page 8, Section 2.2.3 Source Control Mass Reduction. As discussed in our February 2, 2015 review of the Storm Water Data Gaps Investigation and Site-Wide Conceptual Design Update Report and again in our February 3, 2015 review of the Storm Water Source Control Measure Basis of Design Update Report, the objective of source*

control needs to be expanded to include prevention of unacceptable risk to in-water receptors, in addition to the stated objective of preventing sediment recontamination.

See response to Specific Comment 3.

9. *Table 1. Source Control Data Evaluation. See comment 2 above.*

See response to Specific Comment 2.

10. *Table 1. Source Control Screening Evaluation. As discussed in our February 2, 2015 review of the Storm Water Data Gaps Investigation and Site-Wide Conceptual Design Update Report, and again in our February 3, 2015 review of the Storm Water Source Control Measure Basis of Design Update Report, the exclusion of source control for Outfall P is premature. Stormwater samples collected by Vigor do not meet the first flush criteria presented in the DEQ Guidance for Evaluating the Stormwater Pathway at Upland Sites. Additional monitoring is needed before determining whether or not Outfall P can be excluded from source control measures..*

Additional monitoring of Outfall P has been proposed in the *Storm Water Source Control Measure Design Update* report.

11. *Attachment B Storm Water Source Control measure PHASE 3 – Stormwater Reconveyance and Bioretention Pond Design Drawings. As discussed in our February 3, 2015 review of the Storm Water Source Control Measure Basis of Design Update Report, Vigor's April 17, 2014 letter responding to DEQ's review of the 60% Design Drawings stated that flow calculations for the required bioretention pond sizing, including media infiltration rate, pond volume, and bypass details would be provided in the basis of design report. This information is again not included in the Design Update. A summary of the design criteria used for the south bioretention pond needs to be included in the report. The report does not include sufficient information to evaluate the basis of design for the bioretention facility. For example it does not present the treatment capacity of the bioretention pond (i.e. storage/flow through rate). The report needs to clearly present the flow calculations for the bioretention pond sizing. This should include the required infiltration rate of the filter media for*

the maximum treatment volume/rate to support the proposed pond size and details on the overflow or bypass thresholds.

Updated design criteria have been presented in the *Storm Water Source Control Measure Design Update* report. Design criteria, treatment volumes, and bypass flows are presented in Table 5 the *Storm Water Source Control Measure Design Update* report.

12. *As discussed in our February 3, 2015 review of the Storm Water Source Control Measure Basis of Design Update Report, the report did not include a draft performance monitoring plan. Based on Vigor's April 14, 2014 letter and our recap of our February 6, 2015 meeting, DEQ anticipated a draft performance monitoring plan would be submitted with this report so it could be reviewed co-currently. Please provide a draft performance monitoring plan as soon as possible.*

A draft performance monitoring plan has been included in Section 3 of the *Storm Water Source Control Measure Design Update* report.

If you have any questions or require additional information, please feel free to contact me at (503) 488-5282.

Sincerely,
ERM-West, Inc.

Brendan Robinson, P.E.
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